

FURTHER INFORMATION ON THE BREEDING BIOLOGY OF THE HONEY GUIDES

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ABSTRACT: In this paper recent additions to our knowledge of the reproductive biology of four of the African species of honey guides of the genus *Indicator* are presented with comments for their proper evaluation and correlation with earlier information. The egg of *Indicator maculatus maculatus* is described for the first time; five new host species are given for *I. indicator* (*Merops superciliosus chrysocercus*, *M. orientalis viridissimus*, *M. nubicus*, *M. pusillus pusillus*, and *M. bulocki bulocki*), and one each for *I. minor* (*Lybius leucocephalus senex*) and *I. conirostris* (*Gymnobucco bonapartei cinereiceps*).

Our knowledge of the breeding biology of the honey guides is still far from complete, but the various bits of new information recently made available help to fill some of the existing gaps. These are given below for each of the four African species of *Indicator* to which they apply. I hope that competent observers and students of birds in various parts of Africa may use their opportunities to further our knowledge of these difficult but fascinating birds.

1. Spotted Honey guide. *Indicator maculatus* G. R. Gray

The egg of the nominate race of the spotted honey guide has remained undescribed. The first known example, now in the collection of the Los Angeles County Museum of Natural History, was collected at Boron, in the Ivory Coast, toward the end of June, 1968, by Daniel Parelus, who sent it to me. The egg is pure white with slight gloss, like those of all species of *Indicator* whose egg shells are known, and measures 23.4 x 18 mm. It is very similar to, but slightly larger than, the single recorded egg of the central African race of this species, *I. maculatus stictithorax*, which measures 21.6 x 17.7 mm.

These two eggs, one of each of the two subspecies of this honey guide, were collected under precisely similar conditions. Parelus had set a trap of fine net very close to the ground, and he caught in it a female spotted honey guide, which, on dissection, proved to be in active breeding condition. The *maculatus* egg was on the ground immediately beneath the net and must have been laid by the captured bird, although it was not noticed until the next morning when another female spotted honey guide was taken in the trap. The second bird could not have been responsible for the egg as it was in non-breeding condition.

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In like manner, the egg of *I. maculatus stictithorax*, taken in Rio Muni (now Spanish Continental Guinea) in January, 1952, by Jorge Sabater, was also found on the bare earth just beneath a net trap close to the ground, in which a female spotted honey guide was taken at the time.

Lest it be thought that the typical race of this species is new to the Ivory Coast, it may be recalled that Bigot and Roux (1966: 148) reported three examples from there in 1962. These were the first actual specimen records from that country, and were followed by those obtained by Parelius six years later. Bigot and Roux noted that the stomach contents of their specimens contained remains of chiton from beetles and spiders. This caused them to comment that the spotted honey guide was far from being exclusively a wax eater, but fed equally on small terrestrial arthropods.

I emphasize once more that beeswax is not the whole, or, so far as we know, even the most important element of, food of this or of any of the species of *Indicator*, but is something added to the regular insectivorous diet of these birds, although with apparent desire on their part. In the honey guides of the genera *Melignomon* and *Prodotiscus* the wax found in their stomachs is not wax from becomb, but is from scale insects, Coccidae.

2. Greater Honey guide. *Indicator indicator* (Sparrman)

Five additional hosts for the greater honey guide have recently been reported in Nigeria, all of them species of bee eaters. It was known previously that members of this family are highly favored as hosts by the greater honey guide, so it is not surprising to find that additional species of the group are similarly parasitized. Four of the five are species new to the host list; the other one is a sub-species previously unrecorded in this capacity, but conspecific with another race already known to be victimized in other parts of Africa by the same species of honey guide. The new data, given below, together with the information previously assembled by me (Friedmann, 1955, 1958, 1968), show that nearly 30 per cent of all recorded instances of parasitism by the greater honey guide, actually 47 out of 161 cases, have involved bee eaters as the hosts.

The additions are as follows:

Blue-cheeked bee eater. *Merops superciliosus chrysocercus* Cabanis and Heine.

Walsh (1966: 74) first recorded this bee eater breeding in a sand bank on the Niger River about 20 kilometers south of Kainji Dam, Kontagora Division, Nigeria. This constituted a considerable southern extension of its known breeding range, as until then the bird was not known to nest south of 15° 8' N, approximately 60 kilometers south of Ansongo, on the Niger River, in the French Sudan. From June 29, 1966, Walsh studied the Kainji Dam colony of some 14 nest holes to which the birds were seen carrying food, either to incubating mates, or, more probably, to young in the recesses of the tunnel nests. On July 16, Walsh dug out one of these nests and found it to contain as its sole inmate a young greater honey guide nearly ready to leave the nest. From data on other nestlings of this honey guide it is known

that the period from hatching to fledging is approximately a month. This would place the date of egg laying around the beginning of June.

This is the first record for the blue-cheeked bee eater as a host of the greater honey guide. It is apparently the same instance that was listed later by Wells and Walsh (1969: 14). Additional reports may be anticipated as the blue-cheeked bee eater seems to be spreading southward in Nigeria. Walsh (in litt., September, 1969) informed me that the 1966 colony of 14 nest holes had increased to 90 nest holes in 1967, and in 1968 he discovered another colony of about 150 nest holes about eight kilometers farther south on the Niger River.

Little green bee eater. *Merops orientalis viridissimus* Swainson

Fry (1967: 12) added the little green bee eater to the list of victims of the greater honey guide in Nigeria. No details were given, and it is not possible to say whether but a single such instance or more than one came to his notice.

Nubian carmine bee eater. *Merops nubicus* Gmelin

Wells and Walsh (1969: 14) reported this bee eater to be parasitized by the greater honey guide near the Kainji Dam, Nigeria. In reply to my inquiry Walsh (in litt., September, 1969) informed me that the report was based on seeing recently fledged young of *Indicator indicator* at the colony of carmine bee eaters, but as the observations were made by Wells he could not elaborate on them, and Wells had departed for Malaya and could not be reached readily. It is unfortunate that the observations as recorded did not specifically mention feeding of the young parasites by the adults of the host species, but the fact that there were more than one of the young honey guides in immediate proximity to the nesting colony adds substance to the record, the exact wording of which is as follows "... At the Shugunu *nubicus* colony in 1966 young honey guides were on the wing in V (May), before the majority of young bee eaters had left the next (nest) ..."

Least bee eater. *Merops pusillus pusillus* Müller

In eastern and southern Africa the race *M. p. meridionalis* has long been known to be one of the most frequent, if not the very most frequent, of the victims of the greater honey guide. It is therefore not surprising to find that in Nigeria the nominate race of this bee eater is also similarly imposed upon by the parasite. The first such instance was reported by Dodds (1959: 118) in a paper overlooked by me until recently, and then additional and wholly independent observations were published by Fry (1967: 12).

White-fronted bee eater. *Merops bulocki bulocki* Vieillot

The nominate race of this bee eater has been found to be a frequent victim of the greater honey guide in Nigeria by Fry (1965: 78, and 1967: 12). If we were to follow White (1965: 234) in considering *bullockoides* conspecific with *bulocki* it would be pertinent to state that the former taxon is known

to be parasitized in Kenya and Rhodesia, where, indeed, it seems to be a regularly selected host, for which at least six records have been reported (Friedmann, 1968: 3). However, Fry (1969: 574) after extensive field as well as museum studies, considers *bullockoides* and *bullocki* to be valid taxa, although closely related species, and I concur.

Boehm's bee eater. *Merops boehmi* Reichenow

In my 1968 paper (Friedmann, 1968: 3) I cited Benson, Brooke, and Vernon (1964: 67) as reporting a Zambian instance of this bee eater serving as a honey guide host. In this capacity it was known earlier only from a single case found in Malawi. Since then Benson has informed me that there was no Zambian record and that he and his co-authors had combined Malawi and Zambia data in their paper.

While additional instances of parasitism by the greater honey guide have come to my notice since my 1968 paper, they have contributed no new information, but merely added to earlier, similar occurrences. In two other species of *Indicator* there are, however, one new host record for each.

3. Lesser Honey guide. *Indicator minor* Stephens

An additional host for the lesser honey guide (nominate sub-species) may be reported solely on a set of eggs of the white-headed barbet, *Lybius leucocephalus senex* (Reichenow), with one of the lesser honey guide. These are currently on display in the exhibition galleries of the National Museum in Nairobi. The set apparently was acquired by the Museum from Sir Charles F. Belcher, but I was unable to learn the locality or date of collection when visiting the Museum in October, 1969.

4. Thick-billed honey guide. *Indicator conirostris* (Cassin)

Mr. Gorman M. Bond informed me that in the second week of June, 1965, A. Forbes Watson collected a nestling female of this honey guide from a nest of a grey-throated barbet, *Gymnobucco bonapartei cinereiceps* Sharpe, in the Kakamega Forest, western Kenya. This is the first record for the subspecies *cinereiceps* as a victim of the thick-billed honey guide, although the nominate race of the barbet had been known earlier to be parasitized in Cameroon. The Kakamega bird is now in the National Museum of Natural History, Washington.

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